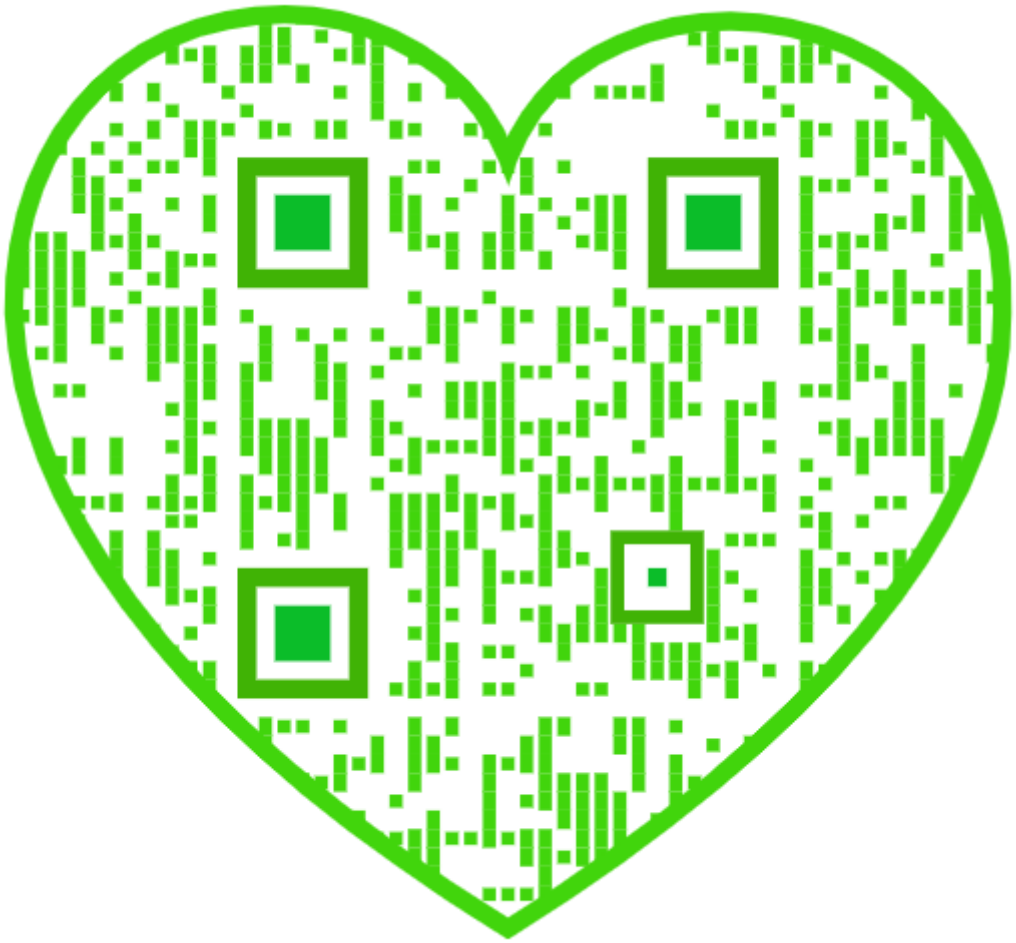
Mushrooms Ferns and Grasses

Jacob Edmund Jones.



Mush-rooms Ferns and Grasses

PHOTOGRAPHING NATURE
ONE METHOD

THE RESULT

POISON IVY
LEAVES, FLOWERS AND FRUIT

For details see page 63

Mushrooms, Ferns and Grasses

and

Some More Wild Flowers

Companion volume to
"Some Familiar Wild Flowers."

Compiled by
Magistrate James Edmund Jones, B.A.
Toronto

James Edmund Jones
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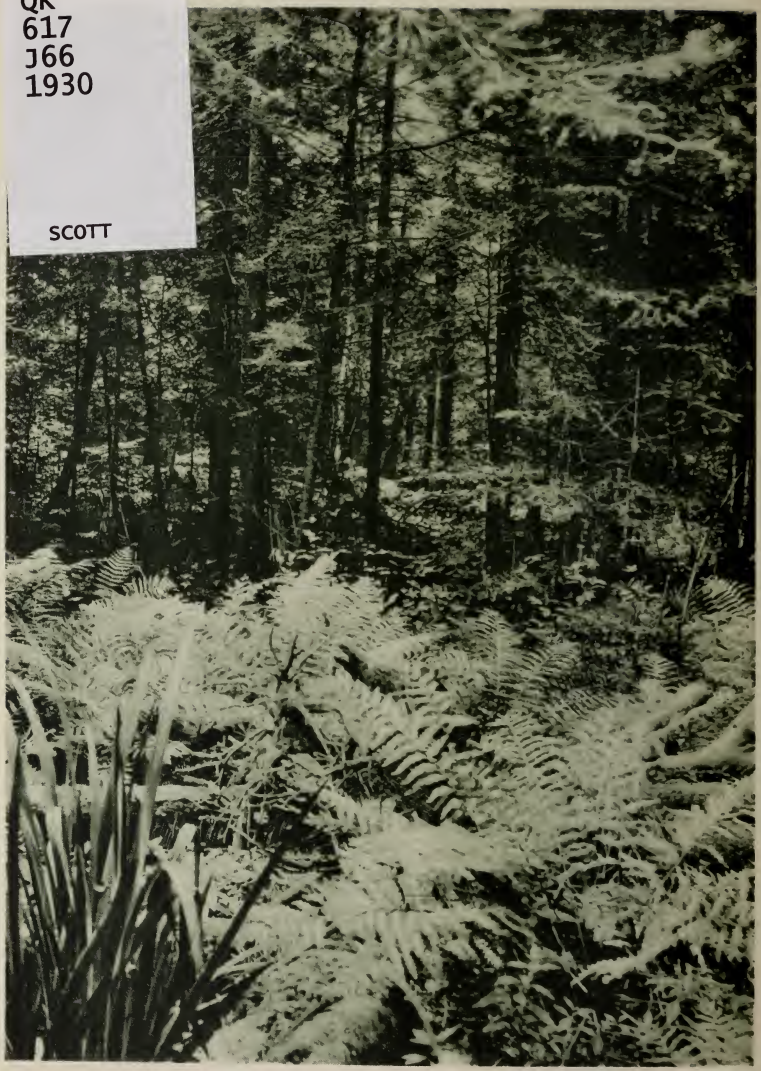


A glimpse of the author's fern garden at Minneweh Lodge, Lake Bernard, near Sundridge, in Northern Ontario, where ferns and orchids abound under over twenty different kinds of trees.

PREFACE

OF the making of books—about mushrooms as about other things—there seems no end. Mushrooms must interest very many readers, for Dr. Howard A. Kelly of Johns Hopkins University, the great surgeon and naturalist, has been able to collect over twelve thousand publications about them.

Adding one more to the number, the author hopes that this pocket-size volume may be of interest and practical value to those who do not profess to make an exhaustive study of the subject. The photographs of mushrooms have come from three sources: the National Museum at Ottawa, the Department of Agriculture of Ontario, and the Mycological Society of Toronto, and the author wishes to give full credit and cordial thanks to the authorities of these institutions.

Besides the mushrooms, there will be found in this book many photographs of wild flowers, ferns and grasses, among them more of the wonderful flower photographs made by Richard S. Cassels, K.C., which formed the basis of "Some Familiar Wild Flowers" already published, and gained for it so warm a welcome.

Many other friends have been most generous in their co-operation. Stuart L. Thompson and Alexander Gilchrist have permitted the use of photographs of their pressed ferns and grasses. The author is deeply indebted also to F. E. Biss of Toronto for help with the fern section; to J. Hamilton for leave to photograph his living ferns; to Dr. John Dearness of London, Ont.; to W. S. Odell of Ottawa; Dr. R. E. Stone of Guelph F. W. Fraser and G. S. Bell of Toronto for revision of the reading matter in the mushroom section; to Homer D. House, Chief Botanist of New York State, and H. Groh of the Chief Botanist's Department at Ottawa for help in identification of specimens; to Ernest H. Finlayson, Chief Forester at Ottawa; and to many others.

"Some Familiar Wild Flowers" already forms part of the equipment of a number of schools and the author earnestly hopes that that little book and this, its companion volume, "Mushrooms, Ferns and Grasses," may give added interest to the study of nature in these especial forms by young people and by many older people as well.

PHOTOGRAPHING NATURE

Per ardua ad astra. Literally, "By steep (ways) to the stars;" colloquially, "It is only by hard work that we reach the 'high spots'," but more elegantly, "It is only by strenuous efforts that we achieve success."

A mere snap-shot artist seated in a luxurious seat of a high-powered motor-car cannot hope to get results worth including in a book, or even in a private album. In this short article it is not possible to condense the instructions that may be found in a good photographic primer, but some idea may be given of the care and patience required for worth-while results.

A friend of mine has spent much of his leisure time for five years in trips to woods and marshes to secure specimens. In most cases he brought them back to his home wrapped from the light and air in paper, and worked in a special room at his home where the wind did not shake his specimen, and he could secure "time-exposures" under the most favorable conditions. For colors, yellow, red, etc., he used proper filters, and with a camera equipped with special lens, bellows and panchromatic plates was able with infinite patience and proper backgrounds to secure first-class results.

On the front inside cover are two pictures showing an outdoor method which may be used on a very still day. The specimen is mounted on a substantial firm telescopic music stand which is equipped with arms consisting of test-tube holders from a chemical laboratory attached to the vertical portion of the stand. Rubber should be used for lining, so that the flower may not be injured when it is gripped. This clever contrivance is the work of my kind friend, Mr. Roland Watson, of the Lantern Slide Department, Parliament Buildings, Toronto, whose assistance I gratefully acknowledge.

Best results are produced in a soft light rather than in bright sunlight. A small white silk tent may be placed over the object to protect it from the wind and from the strong sunlight. If the aperture which lets in the light is opened wide, a shorter exposure is required, but only a portion of the object is liable to be in focus. It is best in most cases, if a close-up is desired, to place appropriate backgrounds. Large cardboard shields of various colors are easily secured, and these serve also as windshields. It is more convenient, however, to carry some material such as velours, which is differently colored on back and front, and does not crease easily. Be sure to place the plant in as natural a position as possible. Be prepared to spend some money on plates while making experiments as to the best period of time exposure. Destroy all unsatisfactory results.

With a hobby like this you will be less tempted to take purposeless motor trips, and will have much delightful exploration and exercise within easy distance of your home. The side lines and woods will have a new meaning and recall pleasant memories. The front seat of your car can be fixed so that your car may be a bed on a moment's notice. In the morning, waking in some woodland glade, you will hear the chorus of the birds at their best, or camped beside a waterfall, you will be lulled to a refreshing sleep. J.E.J.

MUSHROOMS

The poet Pope wrote:

"A little knowledge is a dangerous thing."

This is not true of mushrooms, provided the knowledge be of the right sort. Mushrooms and toadstools are the same thing—no more difference than between a "gentleman of color" and a "nigger," the latter merely a term of contempt. Some people have an idea that toadstools are poisonous, and mushrooms not.

The first thing to learn is to recognize the *Amanitas*, the deadly poisonous group, and then learn some of the common edible mushrooms. One may easily learn ten edible, and if his knowledge extends no farther, and he can avoid the Amanitas, he will enjoy, and profit by, his "little knowledge." Messrs. Güssow and Odell, who have written the best Canadian book in popular style, include 62 genera and 174 species; Nina L. Marshall, the author of a widely-known American book, 80 genera and 141 species; Emma L. T. Cole, 100 species; Dr. R. E. Stone, in "Mushrooms of Ontario," 31 genera and 76 species. In this little handbook, for what it is hoped may be found good reasons, are only 11 genera and 31 species. If the reader desires to become learned he may study any of the above treatises, and eventually invest in McIlvaine's "One Thousand American Fungi." But most of us have not time for such serious study, and will be content with just a little practical knowledge.

If you are a beginner, avoid mushrooms that are not in this booklet unless you are with an expert. Peeling, silver spoon turning black, odor, taste, color, or change of color when bruised, are not tests in themselves to prove whether mushrooms are poisonous or not. *Amanitas* are deadly poisonous mushrooms. Others may vary from violently poisonous to unpleasant or unpalatable; some are inedible because of being woody. Some are decorative, or pictures may be traced, or signatures written on them. Keep mushrooms you are not sure of quite separate from those that you intend to eat. Wash your hands after handling *Amanitas*. Avoid "buttons" (undeveloped specimens) and decayed or over-mature specimens. When gathering specimens to be identified later one should be careful to secure the whole plant. The base of the stem of some may be well under the surface of the ground and in the case of the *Amanitas* this is where we look for the poison cup or volva, one of the principal means of recognizing this group.

One means of identifying mushrooms is by the color of the spores, white, pink, brown, purple, black. Cut off the stem close to the cap, place the cap with the gills down on dead white paper or on newspaper showing strong black and white contrasts, cover for an hour or two with a tumbler. As one mushroom produces thousands, if not millions of spores, you soon have a beautiful and instructive deposit. The color of the spore-print is usually similar to that of the gills, but for some species is very different.

As the first question concerning a mushroom is "Is it poisonous?" let us start with two deadly ones:

AMANITAS (A-man-ee-tas). Some of the twenty species of this genus are edible, e.g., the *Caesaria* (Orange) and the *Rubescens* (Blushing), but *the beginner will avoid all Amanitas*, though the Romans called the *Caesaria* "Food for the Gods." Nine species in all are described by Güssow and Odell, Marshall, Stone, and Cole, five poisonous, two edible, and two questionable. It will be necessary for the beginner to learn to recognize the *Destroying Angel* and the *Fly Agaric*. The young plant of this genus is covered by a thick volva; there is a

veil-like ring on the stem, and a typical poison-cup (the remains of the lower portion of the volva or wrapper) underground at the base of the stem. The GILLS are not attached to the stem which is easily separated from the cap. Gills of the poisonous ones are white, and remain white for an indefinite period after being uprooted, and after wilting or drying. But the gills of the *Fly Agaric* may be tinged with yellow. The ring, especially in immature specimens, usually adheres in whole or in part.

DEATH or *DESTROYING ANGEL*. *Amanita phalloides* (phal-loi'-des). Including *Amanita verna* when cap and stalk are pure white, and CAP is shiny and slimy when fresh. This mushroom has caused more deaths than any other. The pure white one, because of its beauty, is all the more dangerous. The RING is high on the stem, and firmly attached. The cap is 1½ to 5 inches broad; glossy-white, yellowish or dull green, and often olive-gray to greenish-brown. It grows on borders of woods or in them; very rarely in the open. If forest soil has been deposited on lawns, it is possible for it to appear there, but very rarely so. The CAP is bell-shaped, then flat, often with a few loose white scales on top. STALK 2 to 8 in. high, ¼ to ½ in. thick. Season, July-Sept.

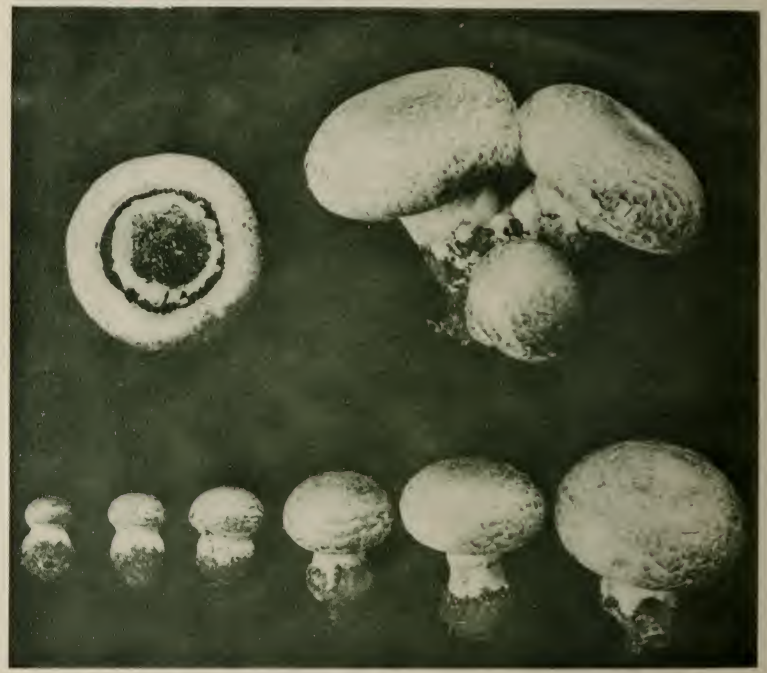
The poison of this mushroom is called amanita toxin and is as deadly as the poison of rattlesnakes. It is not detected by taste, and is therefore the more dangerous. No ill effects may be felt for 6 to 15 hours after eating. No known antidote. Only treatment, emetics and purgatives, but a doctor should be called at once. Do not inhale or even absorb the spores. Wash the hands thoroughly.

FLY AGARIC. FLY AMANITA. Amanita muscaria (mus-ca'ri-a). At one time an ingredient for fly poison. In woods or borders. June till frost. Large, handsome. Contains a poison called muscarine which paralyses the nerves controlling the action of the heart. In cases of poisoning cause vomiting by tickling throat with feather or otherwise, and use powerful emetics other than salines. A physician will inject atrophine, 1/50th to 1/100th of a grain. This mushroom, having to most people an unpleasant taste, is not so liable to be eaten as the *Destroying Angel*. Grows singly, not in groups, mostly in poor soil. CAP 3 to 6 in. in diameter; round, then flat yellow or orange, or bright red, covered with white or light yellow scales (the remains of the wrapper) which may be easily rubbed off. Lighter color near margin. STALK 4 to 6 in., white or yellowish, hollow when old. Base bulbous, *covered with remnants of the wrapper*. Above the bulb the stem is shaggy or scaly. GILLS free, white, or slightly tinged with yellow, do not darken after being picked. RING large, white, soft, ragged, high on stem, and attached. *Frost's Agaric*, which is also poisonous, is smaller, and of same general appearance, but lacks large bulb.

Having learned to avoid all mushrooms that resemble *Amanitas*, the beginner will do well to start his practical acquaintance with mushrooms by making a study of the Mushroom known to commerce, the *Agaricus* (A-gar'i-cus), in some books called *psalliota*.

One will likely study mushrooms with more success if he enjoys eating them. Let him therefore at least once a week for several weeks buy the mushroom sold in reliable shops, examine carefully each one before placing it in the frying-pan, so as to familiarise himself with this species in all sizes, shapes and stages of development, and note carefully the points in which it differs from an *Amanita*. As this species has been brought under cultivation, one can pursue his studies before the season for field mushrooms opens, and learn many different ways of cooking them. Let him not be content with merely frying them. Güssow and Odell give many excellent recipes.

SPORES are brownish-purple. CAP thick-fleshed, meaty, smooth, or scaly; white or dingy-brown, never bright colored. GILLS not attached to stem; white or pink when young. As they mature they change from purple-brown to blackish-brown. STEM central, solid, often becoming hollow, easily separated from cap. RING prominent. No VOLVA. EDIBLE. Marshall describes 8 kinds, Güssow and Odell 6, Stone 3, Cole 2. Let amateur confine his attention to those growing in meadows or on lawns.



COMMON or FIELD MUSHROOM. Psalliota (Agaricus) campestris. Latin *campus*, a field. Lawns and meadows. Extensively cultivated in cellars, green-houses, etc. In fields late spring till autumn. CAP 1½ to 4 in. wide, dry, smooth, soft, silky. At first hemispherical, later flat. STEM 2 to 3 in. long, solid. The *Horse Mushroom* (*P. arvensis*) which resembles it, is larger; STALK becomes hollow; is often found in fairy rings (large circles).

RODMAN'S MUSHROOM. P. Rodmani. Common on lawns and boulevards. EDIBLE. CAP white, sometimes with tinges of yellow. 1½ to 3 in. broad. GILLS whitish, then reddish-pink and purplish-brown. STEM short. RING double, at or below middle of stem. FLESH unusually thick. EDIBLE.

INK CAPS. *Coprinus* (Co-pri'nus). All three species delicious and easily identified. Uncooked, taste like nuts. Oblong or cylindrical CAP expands to bell-shape when ready to dissolve into inky fluid. FLESH thin. SPORES black. STEM hollow, white, smooth. Grow up in a night, and last about a day. In large groups on the ground, on manure and rotted stumps. Those on outer rim mature soonest. In black stage unappetizing in appearance, but still EDIBLE. Most other over-ripe edible mushrooms are unpalatable. GILLS free, that is, not attached to the stem.

SHAGGY-MANE. *Coprinus comatus* (co-ma'tus). The largest of the three species. See illustration on front cover. *Coma* Latin for hair. CAP 2 to 5 in., centre purplish-black; remainder has dark scales, showing white flesh beneath. GILLS tinged with pink, then turning black. RING moveable up and down, soon drops.

COMMON INK CAP. Coprinus atramentarius (a-tra-men-ta'ri-us). CAP 1½ to 3 in. broad; egg-shaped, flat when expanded; grayish to smoke-brown. MARGIN wavy or lobed, upturned when old. FLESH very thin. GILLS white to pink at first, changing to purple, then black. SPORES black. Rich soil. Waste places and woods.

GLISTENING INK CAP. C micaceus (mi-ca'-ce-us). The smallest of the three. CAP ovate, then bell-shaped. Not so liable to go to ink in dry weather. Mica-like scales on young specimens. CAP tan to yellowish-brown. In woods and in streets under trees (elm, poplar, etc.). GILLS white, then black.

PLEUROTUS (Plu-ro'tus). Three common species, all EDIBLE. Thick and fleshy. STEM absent or attached to some point not at centre of cap; short, stout, solid or absent. GILLS generally extend down the stem. FLESH white, tough. No RING or VOLVA (Poison Cup). Grows on tree trunks, branches or logs, in dense, overlapping clusters. Usually fan-shaped.

OYSTER MUSHROOM

WHITE OYSTER MUSHROOM. *P. ostreatus* (os-tre-a'tus). CAP 3 to 8 in., shell-shaped, pale grey to yellowish-white, moist. Summer and autumn. *DARK OYSTER MUSHROOM* (ser-o'ti-nus) resembles it, but yellow, greenish-brown or olive.

ELM MUSHROOM. *P. ulmarius* (ul-ma'-ri-us). Mostly on upright elms or logs. CAP white or gray.

PARASOL MUSHROOM. Lepiota procera (Lep-i-o'-ta pro-ce'ra). Long STEM, 5 to 10 in., with bulbous base, brownish, spotted hollow, or with cottony pitch, covered with closely pressed scales. CAP with dark apex, convex, like open umbrella; brownish scales. RING thick and firm, often moveable on stem. GILLS whitish. CAP has a raised centre. No VOLVA. As cap expands the grayish or brownish-red surface breaks up, and between the scales may be seen the white flesh underneath. Season, July to Sept. Thin woods, pasture and roadsides. Dries readily. Revives when soaked in water. EDIBLE.

BOLETUS. Over 100 species, many edible, some unpalatable and some mildly poisonous. The amateur will avoid them all. He will recognize them by their not having GILLS, but PORES instead. The CAP is fleshy, and decays easily; the underside is porous, and soft spongy. Grows on ground. Marshall describes 20 kinds, and gives each a different color for cap.

PUFF BALLS. Grow on ground. All EDIBLE before becoming powdery and puffy at maturity. Easily distinguished from other mushrooms as the interior is uniformly fleshy, white, firm and cheesy, with no sign of undeveloped CAP or other mushroom parts. Some books call the smaller kinds *Lycoperdon* (Ly-co-per'don), and the larger, *Calvatia* (Cal-va'shi-a). Vary in size from ½ in. to 2 ft. in diameter.

GIANT PUFF BALLS. *Calvatia gigantea* (gi-gan-te'-a). Pastures and roadsides. Aug. and Sept. Have been found weighing over 20 lbs. When cut, the exposed surface becomes dry and preserves unused portion for several days. Before days of matches the dry threads were used as tinder to catch sparks. Spore-dust was used to stop flow of blood from a wound.

Young

Mature

CARVED PUFF BALL. *C. caelata* (ce-la'ta). Broadly top-shaped. Solitary. In rocky pastures.

SKULL-SHAPED PUFF BALL. *C. craniformis* (cra-ni-for'mis). Smaller than *Giant Puff Ball.* Only upper two-thirds becomes powdery. Surface often becomes wrinkled. On ground in woods. Very large.

(Not illustrated)

CUP-SHAPED PUFF BALL. C. cyathiformis. Very like the preceding. Sterile base remains on the ground after maturity.

PEAR-SHAPED or CLUSTERED PUFF BALL. Lycoperdon pyriforme. Very common. In dense clusters. Small. July-Oct. Dingy-white or brownish. Found all over the world.

CRESTED or TOP-SHAPED PUFF BALL. L. gemmatum. 1 to 2 in. high. Resembles a top. Many plants often crowded together. On wood or on ground. Aug. to Oct.

MORELS. *Morchella* (Mor-kel-la). STEM hollow or fluted, brittle. CAP hollow, firmly attached or fused with stem, covered with broad shallow pits, separated by a net-work of low ridges. Spring or early summer only. Buff yellow, tinged with brown at first, then darker. Six common species, distinguished by method of attachment to stem. All EDIBLE. May be dried, to be later revived in water. Morels are the most sought for spring and early summer mushrooms.

COMMON MOREL. *M. esculenta.* CAP and STEM hollow. Beginner is not liable to mistake it for a "Stink-horn." Latter is edible when young; when mature, has bad odor.

NARROW-HEADED or SLENDER-CAPPED MOREL. *M. angusticeps.* 3 in. high. HEAD 1 to 2 in. long, narrow, scarcely wider than stem, which is pipey-clay-white. Woods in May.

BIG-STALKED MOREL. *M. crassipes.* Short head, thick stem.
(Not illustrated)

DELICIOUS MOREL. *M. deliciosa.* CAP oblong or cylindrical, growing into stem. Looks like honey-comb. Moist woods, orchards, under verandahs, etc.
(Not illustrated)

CAUTION. There is a mushroom called *GYROMITRA* which occurs both early and late, and which might be confused with Morels. It should never be eaten when stale or deteriorated, for it then develops a deadly poison. The Gyromitra (when fresh) may be made safe by being parboiled ten minutes and water thrown away. The Morel has but one cavity which extends through both cap and stem. Gyromitra has more than one cavity. Further, the outside of the Morel cap consists of depressed pits, while the other is very irregularly gnarled like the convolutions of a brain. There are instances on record of fatal consequences from eating Gyromitra, justly called "False Morel."

CORAL FUNGI. Clavaria (Cla-var'i-a). Differ from gilled, pored, and other mushrooms by being composed of many branches resembling coral formation. All EDIBLE, especially good when young. Grow on ground, on wood, and on decaying leaves. White or yellow; sometimes brown, with tips of branches bright-tipped. The commonest species are the Golden, Yellow, Crested, Ashen, Beautiful and Fairy Club.

CRESTED C. cristata (cris-ta'ta) Small, 2 to 3 in. high. White or tinged with pink or yellow. Cool, shady, moist places. June-Oct.

ASHEN. *C. cinerea* (cin-er'i-a). June-Oct. 1½ to 3 in. high. Branches very numerous, with slender, gray points. Brittle. Open woods, in clusters. Aug. to Oct.

GOLDEN. *C. aurea* (au'-re-a). Aug.-Oct., 2 to 4 in. high. Branches golden yellow; compact conical tufts. Resembles *C. flava*. Latter turns reddish when bruised. Thin woods and open places.

PALE YELLOW. *C. flava* (fla'va). 2 to 5 in. high. July-Sept. Thin woods and open places. Fragile. When bruised becomes reddish. Resembles *Golden*. *(Not illustrated)*

BEAUTIFUL. *C. formosa* (for-mo'sa). More branched than *C. flava*. Stout, whitish stem, erect branches, golden to pink. *(Not illustrated)*

FAIRY CLUB. *C. pistillaris* (pis-til-la'ris). No branches. Resembles an Indian club. Up to 5 in. high., 1 in. diameter. Light yellow, tinged with brown or red. Grassy, open places, or thin woods. Aug. to Sept. *(Not illustrated)*

HYDNUM. The fungi in this group have teeth, and not gills or spores. Most of them are inedible. They vary greatly in shape and size, and grow both on wood and on ground.

WILD FLOWER GARDENS AND ARBORETUMS

These are easily established, especially in well-equipped summer camps. If the camp is in the wilds, a Nature Trail may be laid out.

As long as the Ontario Government publish Dr. J. H. White's wonderful Tree Book for the nominal price of 25 cents, any other manual is unnecessary. Colin S. Farmer, M.A., and I are having great success at Camp Layolomi, Lake Bernard, in Northern Ontario, in labelling trees, so that for half a mile the entrance through the woods has become a picturesque and instructive arboretum. The boys painted galvanized sheets a good yellow, cut them into strips 8 in. by 12 in., and fastened them to pieces of wood with brass tacks that will not cause streaks of rust. They also took pride in painting the reading matter. In order that some other camps may be encouraged to get started on similar projects, I append copies of some of the labels.

BALSAM FIR
Abies balsamea
Second to spruce in value for pulpwood.
Distinguished by blister-like bulges in bark, and by flat blunt leaves.

WHITE SPRUCE
Picea canadensis
Needles 4 sided, sharp.
Look on ground for flexible old cones.
Valuable for paper pulp, etc.

BLACK or SWAMP SPRUCE
Picea mariana
Look on tree for rigid old cones.

CANCE or PAPER BIRCH
Betula papyrifera
Differs from Yellow Birch in leaf, fruit and bark.

MOUNTAIN ASH or ROWAN TREE
Sorbus americana
Also called Service Tree.
Wood of no value, but orange red fruit winter food for birds.

WHITE ELM (Hard Wood)
Ulmus americana
This is one of our tallest and handsomest trees.

RED or PIN CHERRY
Prunus pennsylvanica
Light red sour fruit makes good jelly.

TREMBLING ASPEN
Populus tremuloides
Flat thin stems allow leaves to quiver with slightest breeze.

WHITE CEDAR (Soft Wood)
Thuja occidentalis
Lumber resists rotting in damp.
Valuable for canoes, posts, etc.
Frayed bark for absorbent cotton.

HEMLOCK (Soft Wood)
Tsuga canadensis
Notice each flat needle has a stalk.
Bark used for tanning.
Lumber cheap, coarse.

RED or SWAMP MAPLE
Acer rubrum
Notice reddish twigs and stems.
Leaves bright crimson in fall.

YELLOW or BLACK BIRCH
Betula lutea
Most valuable hardwood in Ontario.

SUGAR or ROCK MAPLE (HARD)
Acer sacchari
Syup and Sugar made from sap. Few teeth on leaf compared with soft maple.

MOUNTAIN MAPLE
Acer spicatum
Never larger than a shrub.

BEECH (Hard Wood)
Fagus grandifolia
Notice smooth bluish-gray bark.
Leaf-veins each end in a protecting tooth.

MOUNTAIN HOLLY
Nemopanthis canadensis
A swamp shrub with round red berries.

WILLOW
Salix
One of over 20 native species of Ontario.
Notice pussy willows in spring.

PAPER BIRCH
Notice the work of destructive man. Avoid marring God's work.

JUNE BERRY
Amelanchier canadensis
Berry dark purple, sweet, edible end of July

VIBURNUM, NANNY-BERRY
Viburnum lentago
Beautiful clusters of white flowers in June.
Fruit (flat stone) sweet and edible.

SPECKLED ALDER
Alnus incana
Name derived from the whitish lenticels on the bark.
Inner bark tastes bitter.

WHY LATIN NAMES?

As French is the language of diplomacy, known to statesmen of many nations, Latin is the language of botanists.

English names are variable and unreliable. There are, for example, many flowers popularly known as "Mayflowers." There is only one *epigaea repens* (Mayflower, or Trailing Arbutus)

Latin and Greek names more often aptly describe the plant or some of its pecularities, or immortalize some great botanist, e.g., *Linnaea borealis* (Twin-flower). Do not, therefore, despise as pedants those who use the Latin names.

OSTRICH FERN. Pteritis nodulosa. Large, 2 to 6 feet high. Grows best in beds of rivers still moist after the spring floods. Propagates chiefly by underground runners. Dark green, short, stiff, fertile fronds, "neck-lace like," spring from the centre of the crown or vaselike circle of sterile fronds in June to July. Cinnamon Fern has cinnamon or golden-brown fertile fronds which mature earlier, and the sterile fronds have forking veinlets, and a tuft of rusty wool at the base of the pinnae. The ferns in the picture on the back cover of this book are mostly ostrich ferns growing in a park near Toronto, Ont. This fern may be successfully transplanted to gardens. The short stalk is deeply channelled in front. Frond broadest about one-third from the tip, and gradually narrows to small pair of pinnae at bottom.

FERNS

Although throughout the world there is an immense variety of ferns, those native to the area north of the Ohio and east of the Rockies are so few that everyone may easily become acquainted with at least two-thirds of them. Mrs. Parsons in her charming book deals with 57, and Herbert Durand with 50. In this book are included 32. If my readers find and become familiar with these they will have a working knowledge of ferns, and will delight in extending their studies by reference to larger works. In order to assist identification I have in many cases printed photos both of living and of pressed specimens. The botanical names are those most recently approved. The common names are from *Standardized Plant Names*, as it is well that the study of ferns should not be complicated with alternative names.

To find the name of a fern first ascertain whether the fertile fronds or portions of fronds differ noticeably from the sterile. The first nine are examples of this first group.

SENSITIVE FERN. *Onoclea sensibilis*. Name perhaps due to its wilting soon after being uprooted, or to its being sensitive to frost. Very common and abundant. Roadsides and wet meadows. Fertile fronds, short, erect, rigid, quite unlike sterile, mature in Aug. and Sept. Dark-green pinnules of fertile fronds rolled up into berry-like clusters appear first in June or July. Plant varies greatly in size from a few inches to two feet high. Stalk long. Fertile fronds often remain standing till next season, and are found, brown and dry, beside new fronds. Notice creeping rootstock from which broadly triangular pinnatifid fronds arise.

OSTRICH FERN. *Pteritis nodulosa*. Large, 2 to 6 feet high. Grows best in beds of rivers still moist after the spring floods. Propagates chiefly by underground runners. Dark-green, short, stiff, fertile fronds, "neck-lace like," spring from the centre of the crown or vase-like circle of sterile fronds in June to July. Cinnamon Fern has cinnamon or golden-brown fertile fronds which mature earlier, and the sterile fronds have forking veinlets, and a tuft of rusty wool at the base of the pinnae. The ferns in the picture on the back cover of this book are mostly ostrich ferns growing in a park near Toronto, Ont. This fern may be successfully transplanted to gardens. The short stalk is deeply channelled in front. Frond broadest about one-third from the tip, and gradually narrows to small pair of pinnae at bottom.

CINNAMON FERN. Osmunda cinnamomea. Said to be named for Osmund of Loch Tyne, who hid his wife and child in a thicket of these tall ferns when the Danes invaded Scotland. Crown of rootstock which protrudes above ground is edible, tasting like raw cabbage. In appearance it resembles a shoe-brush. It is sold commercially on a large scale to growers of orchids, who cut it up, and use it to enrich the soil. Read note under Ostrich Fern to learn some of the differences between the two ferns. The two *Osmundas* (Royal and Cinnamon) are sometimes called "Flowering Ferns," because the fertile fronds are so different from the sterile. They are all easily cultivated, but, if growing in unsuitable places, become stunted, and not easily recognizable.

SENSITIVE FERN. Onoclea sensibilis. Name perhaps due to its wilting soon after being uprooted, or to its being sensitive to frost. Very common and abundant. Roadsides and wet meadows. Fertile fronds, short, erect, rigid, quite unlike sterile, mature in Aug. and Sept. Dark-green pinnules of fertile fronds rolled up into berry-like clusters appear first in June or July. Plant varies greatly in size from a few inches to two feet high. Stalk long. Fertile fronds often remain standing till next season, and are found, brown and dry, beside new fronds. Notice creeping rootstock from which broadly triangular pinnatifid fronds arise.

INTERRUPTED FERN. Osmunda claytoniana. May grow near swamps, but never in water. Large. Easily transplanted. Sterile fronds, once-pinnate, pinnae pinnatifid. Fertile fronds leaflike above and below; centre "interrupted" by fruit-clusters which are first golden-green, and, after spores are discharged in May or June, brown. Distinguish sterile fronds of this from those of Cinnamon Fern by absence of tuft of rusty wool from base of each pinna. Fertile fronds, which curve outward above the fruiting pinnae, are set in a cup or vase formed by the sterile fronds which do not rise as high. The whole plant brilliant yellow in autumn. Root difficult to dig. If fertile fronds are removed early, the sterile grow much larger.

ROYAL FERN and MALE FERN

See page 27

ROYAL FERN. Osmunda regalis. Two to five feet high. Swampy places. Pinnae cut into oblong pinnules. Pale or pea-green, twice-pinnate sterile fronds encircle fertile fronds, which are leaflike below, and tipped above with flower-like, bright-brown fruit clusters. Herbalists used to use this and other ferns for medicinal purposes. In modern times the Male Fern (the root) is the only fern so used. Wordworth wrote some beautiful lines on the Royal Fern, too long to quote here. This fern is particularly attractive when on wine-colored young stems it unfolds its delicate pinks and pale yellows. Foliage resembles that of locust tree. Stem has five to nine pairs of opposite branches, each of which has six or more pairs of long, oval or broadly oblong pinnules. Spore-cases bright green at first, then rich brown. Spores ripen in June.

RATTLESNAKE FERN. *Botrychium virginianum.* Not strictly a fern. Botanical name is from Greek, meaning a cluster of grapes. Spores ripen on long-stalked fertile portions about end of June. Rich, dense, moist, deciduous woods. Sterile blade noticeably large, three main divisions, finely dissected, spreading.

CRESTED WOODFERN. Shield Fern. *Thelypteris cristata* (formerly *aspidium*). Shady swamps, but easily adapts itself to other situations. May be recognized by the fact that "the pinnae, especially of the fertile fronds, twist into a horizontal position like the slats of an open window shutter." (Durand). Evergreen and arching sterile fonds are much shorter than the fertile which are tall, erect and narrow, mature in July and wither in autumn.

SLENDER ROCK (formerly CLIFF) BRAKE. Cryptogramma stelleri Moist shade; more likely to be found in northerly regions. Resembles Purple Cliff Brake, which is found in dry, sunny places. Small, delicate fern, 2 to 5 in., limestone rocks, often in inaccessible places, near harebells, maidenhair spleenworts, walking leaf, etc. Fertile fronds taller and more slender than sterile; spore cases on borders of pinnae. Stalks straw-colored.

PURPLE CLIFF BRAKE. Pellaea atropurpurea No resemblance whatever to Brake or Bracken. Notice unusual bluish or purplish color and odd shape of fronds. Fruit-dots in roundish or oblong cluster under the rolled back margins of both pinnae and pinnules, bright brown at maturity. Stems wiry, purplish-brown. Fertile fronds taller and narrower and more abundant than the sterile. Fronds are of leathery texture, 4 to 12 in. long, once-pinnate near top, bi-pinnate below. Grows in dry, sunny, inaccessible places, often on lime stone cliffs.

CHRISTMAS FERN. Polystichum acrostichoides. Used for winter decorations. Dark, glossy, evergreen fronds of leathery texture may be found among the melting snow of springtime. The narrower upper pinnae of fertile fronds are noticeable, and are taller than sterile fronds. Creeping rootstock sends up fronds in circular clumps in rocky woods or on hillsides in early spring. Grows near Leather Woodfern (Marginal Fern).

BRAKE. Bracken. *Pteridium latiusculum* Large and coarse, frond 3 branched, spreading. Mostly in dry sandy places, both shady and sunny. Common on most continents. Ancient English belief that burning the Bracken will bring rain and drive off witches. Root creeps as much as 20 ft. Fruit-dots are in a continuous line along edges of the pinnules which are rolled back and over them. The poets, parricularly Scott, often refer to it.

"The heath this night must be my bed,
The bracken curtain for my bed."

HAY-SCENTED FERN *Dennstedtia punctilobula*, formerly known as *Dicksonia pilosiuscula*. Rocky upland pastures and moist thickets. If transplanted to a garden is liable to overrun it. Sweetish odor; pale, taperihg, curving, decorative and lacy. Sends up new fronds continuously. Fruit-dots small, each on a re-curved toothlet of the pinnule, borne on an elevated globular receptacle. Thoreau, the famous writer, had a special fondness for this fern, and wrote often in its praise, being of opinion generally that "you should be affected by ferns, that they should amount to something to you, signify something to you, be another sacred scripture and revelation to you, helping you to redeem your life."

AMERICAN MAIDENHAIR. Adiantum pedatum. Rich soil, dark woods, mostly under maples, birches, and beeches. Fronds are produced all summer, every frond fertile. Fruit dots marginal and hidden. Rootstocks slender, branching, close to surface, with black wiry rootlets. Stem black, erect, and shiny. Do not confuse with foliage of the wild flower, Meadow Rue (No. 70 in "Some Familiar Wild Flowers." May be cultivated under proper conditions.

UPLAND LADY FERN. Athyrium angustum (felixfemina). Many varieties of this and of Lowland Lady Fern, the former being best known north of Philadelphia. Has many habitats; deep woodlands, open swamps, stony pastures, and dusty roadsides. This attractive fern becomes dilapidated in late summer. Roots are covered thickly with stem bases of old fronds. The horseshoe-shaped fruit-dots become filled in and hard to distinguish at maturity. When growing in sunny spots the pinnae slant upwards, and middle pairs are noticeably long. When growing in shaded places fronds are broad, and stems wine-colored or reddish. Fronds 2 pinnate.

Where the copse wood is the greenest,
Where the fountain glistens sheenest,
Where the morning dew lies longest,
There the Lady Fern grows strongest.

Sir Walter Scott

SILVERY SPLEENWORT. Athyrium acrosyichoides. Shaded swamps, and rich woods near brooks. "Abundant locally." If transplanted the thick roots should be lightly covered. Thick, leathery, husky, dull-green fronds are like those of Leather Woodfern (Marginal Fern). Notice how the wind in summer time gives glimpses of the very numerous white, oblong or linear fruit-dots which are in a double row. Fertile fronds appear later than sterile, which they closely resemble.

2 *WALKING FERN. Camptosorus rhizophyllus.* Small, slender-tipped fronds, undivided, heart-shaped at base. Grows in same localities as Maidenhair Spleenwort. Sometimes grows in tangled mats. Black, wiry rootlets penetrate crevices. Shaded rocks. Rather hard to find a station for this fern, and its reputed rarity increases interest in it. This fern may propagate by the tip taking root as it bends. Hence the name. Sometimes three generations are found growing in succession without severance.

1 *HART'S TONGUE. Scolopendrium vulgare.* Very rare. This photo was taken in a garden 22 by 40 ft. of a small suburban home in Toronto, where the enthusiastic fern hunter has successfully transplanted 33 different species. Hart's Tongue grows in limestone cliffs. Frond is undivided; from a few inches to nearly two feet long. Heart-shaped at base. Dr. Britton knew of only two stations in the northern U.S.A.

4 *VIRGINIA CHAINFERN. Woodwardia virginica.* After fruiting season is over in July it is hard to distinguish this from Cinnamon Fern, which also grows in water and swamps. Oblong, chain-like fruit dots which merge when old, distinguish it. More common near the sea-coast.

3 *MAIDENHAIR SPLEENWORT. Asplenium trichomanes.* Among shaded rocks may remain green all winter. Mature in July. Have 10 to 15 or more fronds. Highly decorative. Roundish oval pinnae. Fronds 3 to 8 in. long, in dense spreading tufts. Pinnate, with roundish or oval pinnae, and shiny purple-brown stems. American Maidenhair is much larger with a shiny black stem. Rootstock has wiry, matted rootlets which penetrate crevices of rocks. A companion of the Walking Fern. Foliage differs from that of American Maidenhair.

COMMON WOODFERN. Thelypteris intermedia (formerly *Aspidium spinulosum*, var. *intermedium*). "Common" means abundant. Woods everywhere. Durand urges that better name would be "Evergreen Lace Fern." This is a favorite with florists, and millions of plants are sold. Notice upright, short, stout rootstock, and dark brown centres of the scales of the stems. Appears in early spring, fertile fronds maturing in July. Kidney shaped fruit-dots are in rows.

NEW YORK FERN. Thelypteris noveboracensis (formerly *aspidium*). Unsuitable name, as this tall fern is widely distributed, and might better be called Taper Fern, as delicate, plumy, once-pinnate fronds, lance-shaped, bright yellow-green, taper both ways. Dry woods and open meadows. Differs from Marsh Fern by having flat instead of reflexed margins to the lobes of the fertile pinnae. Stalk shorter than fronds. Fruit-dots small, round, in double row. Fertile fronds, which appear later, taller and narrower than sterile. Spreads quickly from fronds springing in tufts from rootstock.

MARSHFERN. Thelypteris palustris (formerly *aspidium*). Beautiful in early spring when prolific fronds are crowned with bright green balls that soon uncurl. Small fruit-dots at first kidney-shaped; in two rows parallel to and near the midveins. Fertile fronds do not appear till late July, and grow taller than the sterile. Lowest pinnae are high up on the stem, as if to keep the frond well away from the water. This helps to distinguish this fern from the New York Fern.

BOOTT WOODFERN. Thelypteris bootti (formerly *Aspidium*). A handsome fern growing in moist woods as high as three feet, especially near elder bushes. Hard to distinguish from other Woodferns. Fertile fronds (fruit-dots round, in double rows) wither, but sterile remain green all winter. Notice lacey cuttings of the pinnules of the long narrow fronds. Sterile smaller and simpler than fertile.

CLINTON WOODFERN. Thelypteris clintoniana (formerly *Aspidium cristatum* var. *clintonianum*). Larger than Crested Woodfern (formerly known as Crested Shield Fern). Swampy woods. Sterile fronds evergreen. Sold by florists.

GOLDIE FERN. Thelypteris goldiana (formerly *Aspidium*). One of the largest and most stately. May be successfully transplanted. Large fruit-dots closely along and near midveins of pinnules. Deep blue-green (lighter underneath) fronds two to four feet long, broadest in the middle. Deep, rich, moist woods. Rootstock, horizontal, easily raised with the hands. Named after a pioneer resident of Guelph, Ont.

LEATHER WOODFERN (formerly Evergreen Woodfern or Marginal Shield Fern). *Thelypteris marginalis* (formerly *Aspidium marginale*). Rocky, wooded hillsides, and between exposed roots of forest trees. Leathery, dark blue-green, bi-pinnate fronds grow in circles or crowns from the large brown, chaffy crown of the rootstock. Notice particularly the conspicuous, uncrowded, round fruit-dots close to the margins of the pinnules, which distinguish this from Crested Shield Fern (Woodfern), and the thick leathery texture. "Even in them I feel an argument for immortality. Death is so far from being universal." *Thoreau*.

COMMON POLYPODY. *Polypodium virginianum*. On shaded rocks. Narrowly oblong, leathery, smooth, evergreen fronds. Varies slightly from English polypody, which grows mostly on trees. Notice conspicuous, large, yellow-brown, roundish fruit-dots midway between margin and midvein. "The bare outline of the polypody thrills me strangely. Simple as it is, it is as strange as an oriental character. It is a fabulous, mythological form, such as prevailed when the earth and air and water were inhabited by those extinct fossil creatures that we find."—*Thoreau*.

NARROW (formerly Long) *BEECHFERN. Thelypteris phegopteris.* This specimen was found in early Sept. on a moist wooded hillside on the Don River, near Toronto. It may also be found on cliffs. It may easily be recognized by the noticeable downward and forward position of the lowest pair of pinnae. Downy, triangle-shaped, bright green fronds wither early.

WINGED (formerly *BROAD*) *BEECHFERN. Thelypteris hexagonoptera.* Notice very large and broad bottom fresh green pinnae, and the ferny odor when crushed. Tiny round fruit-dots near margins and along midveins show in June and mature in August. Notice continuous irregularly shaped wings along the main stem.

BERRY (formerly *BULBLET*). Bladderfern. *Cystopteris bulbifera*. On rocks and in moist woods. Durand says that the new name for this plant of such refined grace is better than the old name, " 'Bulbiferous Bladderfern', which sounds like some hideous malformation that should be given surgical attention." Notice bulblets about the size of a Sweet Pea seed borne near the stem on underside of upper half of mature fronds in July. These bulblets fall and produce new plants more quickly than the spores do. Not liable to be confused with the Brittle Fern (formerly Common Bladderfern), the earliest and shortest-lived fern.

OAK FERN Thelypteris dryopteris. Rarely more than 6 to 8 in. high. Delicately beautiful, light yellow-green. Resembles a miniature Bracken in having three triangular pinnate divisions on slender stem. Mostly rich soil, deep woods.

FRAGRANT SHIELD FERN. Aspidium fragrans. Small, fragrant, tapering, lance-shaped fronds once pinnate. On rocks northward, especially near waterfalls. Fruit-dots large. Stalk and rachis very chaffy. If this or any other small fern is in an inaccessible place, it may be examined through a field-glass. Odor resembles that of raspberries.

MOUNTAIN HOLLY FERN. Polystichum lonchitis. Same family as Christmas Fern. Rocky (calcareous) woods, Gulf of St. Lawrence, and from Niagara Falls to Lake Superior, northward. Easily cultivated in rock gardens. The shiny dark green and thorny pinnae resemble miniature holly leaves. The fruit-dots are borne on the upper pinnae of the fronds, which are not contracted as are the fertile fronds of the Christmas Fern.

RUSTY WOODSIA. Woodsia ilvensis. On exposed rocks, near or on steep cliffs. Fronds small, 2 to 6 in., smooth, and green on upper side, covered with rusty hairs or chaff on under side and on stems. Notice also persistent stem bases of dead fronds. Grows in clumps.

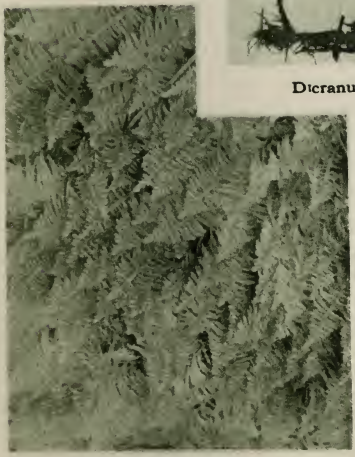
The above are pictures of various kinds of club-mosses (*Lycopodium*), which are sometimes called "Fern Allies." No. 1 Groundcedar (*complanatum*). Like the Runningpine, No. 2 (*clavatum*) it is used for winter decorations, and yields powder for flashlights. No. 3 shows three other kinds, *lucidulum* (Staghorn Moss), *obscurum* (Groundpine), and another.

MOSSES

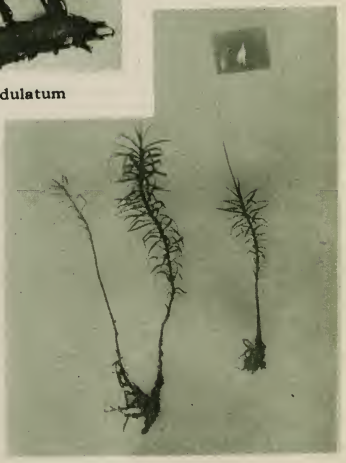
Colliergon Schreberi

Mnium

Dicranum undulatum



Hypnum crista-castrensis



Polytrichum

Duncan A. MacLulich, of Toronto, has kindly permitted the use of the above, and of the photograph on the back cover showing a scene in a Toronto park.

COUCH, or TWITCH, GRASS. Agropyron repens. Per. Rootstalks are running, hence Latin name. One of farmers' worst enemies, but will withstand drought and bind soil on railway embankments, etc. White stems of roots are sharp pointed, and will grow through many obstructions. If cut in pieces, each piece sprouts again.

YELLOW FOXTAIL. Pigeon Grass. *Setaria glauca. Ann.* Grain found in lake dwellings of Stone Age. Still used for human food in parts of Old World. Distinguish by color from Green, Bristly, and other millets.

TIMOTHY. Phleum pratense. Per. Called after a Maryland planter. Best (mixed with clover) for hay. Flowers lavender. Spikes rough. Resembles Meadow Foxtail which has soft spikes.

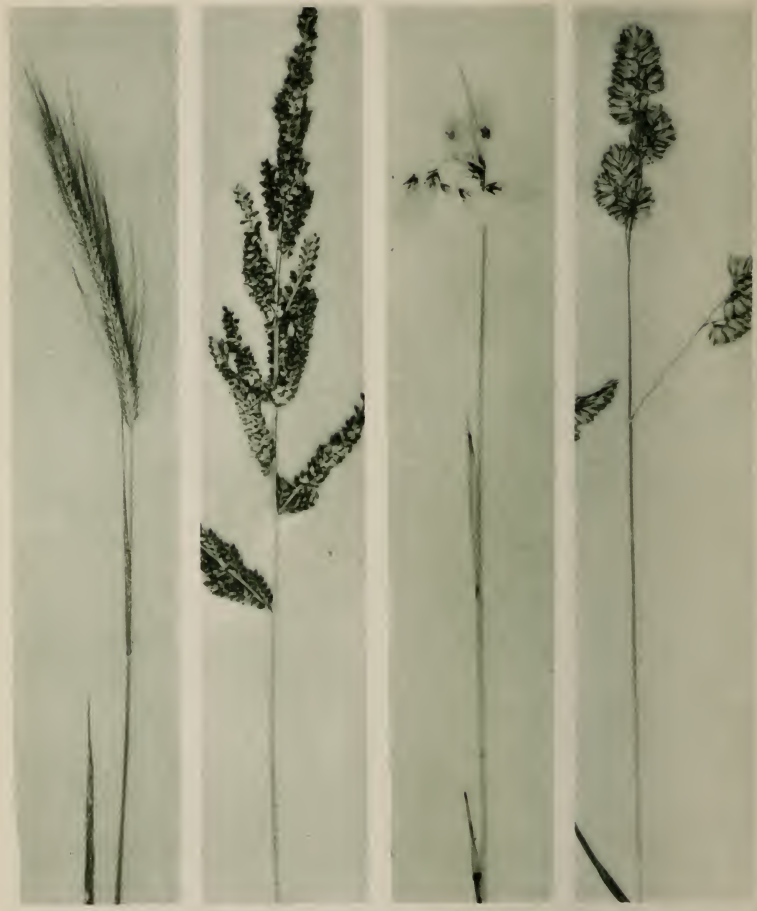
MARSH FOXTAIL. Alopecurus geniculatus. Per. May-July. Resembles Meadow (*pratensis*) Foxtail. Grows almost anywhere. This pretty little plant blooms a month earlier than Timothy, is softer and has shorter leaves.

CANADA BLUE GRASS. *Poa compressa.* *Per.* Blooms early and late. Leaves blue-green. More blue than Kentucky Blue Grass. A pasture grass which will grow even in stiff clay, and resists drought and frost. Grows in circular patches.

SWAMP CHESS. Fringed Brome-Grass. *Bromus ciliatus.* *Per.* Damp soil. Borders of thickets. June-Aug. Its beauty is its only claim.

REED GRASS. *Phragmites communis.* Towers high above all other grasses in the marsh. Grows abundantly. Used for thatching haystacks and roofs of cottages.

TALL MANNA GRASS. *Glyceria grandis.* Mostly in wet lands, where cattle wade to browse. Three to five feet high. Birds fond of seeds



SQUIRREL TAIL. Wild Barley. Tickle Grass. Skunk Grass. *Hordeum jubatum. Per.* A weed, "a most unworthy relative of the useful grain barley." A slender, early-blooming grass. Very common on prairies. The silky heads later become dry, break free, and thus scatter. Has probably come East in grain cars.

COCKSPUR or BARNYARD GRASS. Echinochloa crusgalli. Ann. Rich damp spots. Recognized by its coarse brown tops.

SLENDER COTTON GRASS. Eriophorum gracile. Grows in damp meadows. Easily recognized by cotton white tassels.

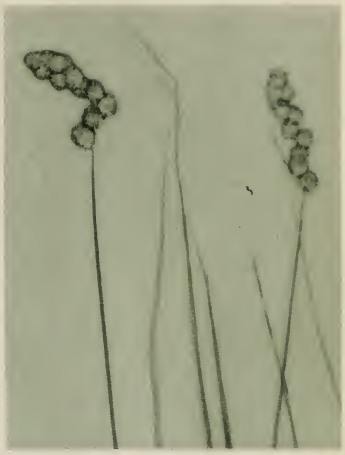
ORCHARD GRASS. Cock's Foot Grass. *Dactylis glomerata. Per.* Soars high in both woods and fields; in bloom, branches spread like a bird's foot. Leaves, blue-green, early and late. Anthers, which color the blossoms, vary, purple, yellow, terra-cotta and pink.

OLD WITCH GRASS. *Panicum capillare.* *Ann.* Dry soil. Does not resemble any other grass of late summer. In Fall the whole plant becomes free and, driven by the wind, rolls along the ground, scattering seeds as it travels. Look for it in ditches in late fall.

BROWN BEARD GRASS. *Andropogan scoparius.*

NODDING WILD RYE. Elymus canadensis. July-Aug. on sandy beaches and in wayside thickets. Stout stems, two to five feet high. In clumps. Always nodding.

LARGE CRAB GRASS. Digitaria sanguinalis. Ann. Mostly regarded as a weed, it may be cultivated for pasturage. In parts of Europe the seeds are eaten with porridge.



FOX SEDGE. *Carex vulpinoides.* A common sedge in moist meadows.

FESQUE SEDGE. *Carex fescucacea.* Blooms in spring and early summer in dry soil.

PENNSYLVANIA SEDGE. *Carex pennsylvanicum.* One of the earliest of our sedges to flower. Its bright stamens show clearly before the leaves, the old leaves of previous year persisting. A common little sedge on open hillsides.

PLANTAIN-LEAVED SEDGE. Very like Pennsylvania sedge in appearance and general habits, but leaves very broad.

HOP SEDGE. Carex pseudo-cyperus. In old days sedges were called "shear-grass," referring to sharp edges of leaves and stems.

POND SEDGE. Dulichium arundinaceum. A common sedge in northern waters.

TRUE or SMALL HOP SEDGE. Carex lurida. Often found with Fox Sedge at edges of marshes.

BRISTLE-SPIKED SEDGE. Cyperus strigosus. Waysides, in both dry and moist soil. One of our later sedges, blooming in Sept., its brown bristles identifying it.

GALINGALE. **Earth Nuts.** *Cyperus diandrus.* **One of the few sedges that tend to grow along the ground in matted form. Wet grassy spots.**

SLENDER SEDGE. *Carex gracillima.* Gray describes 326 species of sedges.

BOG RUSH. Soft Rush. *Juncus effusus*. One of the most abundant of this family. Leafless stem, which grows high above flowering portion as a sort of bract. In Queen Elizabeth's time in high favor for floors of churches and palaces to provide a soft covering for seldom-cleaned floors.

SMALL-HEADED RUSH. *Juncus brachycephalus*. A tiny rush, growing very abundantly in damp places, very easily overlooked on account of its size.

SALT-MARSH BULRUSH. *Scirpus robustus*. One of the coarse conspicuous rushes of damp meadows. Grows in both salt and fresh marshes.

MEADOW BULRUSH. *Scirpus atrovirens*. Brownish flowers. Gray describes 76 species of rushes.

LARGE SPIKE RUSH. *Eleocharis palustris*. Two to four feet high. Shallow water.

GREAT BULRUSH. *Scirpus validus*. Grows as high as ten feet. Leafless.

CHAIRMAKERS' RUSH. *Scirpus americanus*. Stiff triangular stems. Inland streams and salt-water marshes.

SLENDER SPIKE RUSH. *Eleocharis tenuis*. *Per*. Open marshes. Very like Small-headed Bulrush.

WHEAT. Dawson's Golden Chaff. More than one-half of the winter wheat grown in Ontario is of this variety. Wheat, next to rice, is the most used staple food. An annual. Dr. C. E. Saunders, a graduate of the University of Toronto, after many years of patient labor obtained Marquis Spring Wheat by crossing Red Fife and Calcutta hard red wheats, and overcame handicaps of frosts and short seasons, thus contributing incalculable millions to the value of lands in Western Canada.

WHEAT, "O.A.C. No. **104,**" is a variety which was originated through hybridization and plant selection by the Ontario Agricultural College at Guelph. It is almost as widely grown as Dawson's Golden Chaff. Spring and summer wheat are planted in the year in which they ripen; fall and winter wheat in the preceding year.

OATS. This is a picture of the O.A.C. selection of the Banner variety. The Banner Oat is the most widely grown variety in Canada. "All flesh is grass, and all the glory of man is as the flower of grass." (*1 Peter* 1:24: *Isaiah* 40:6.) is true in many ways, as the existence of the human race depends upon grasses, such as oats, barley, wheat, rye, etc. Dr. Samuel Johnson, in his Dictionary, 1755 (the first in the English language), defined oats as "a food for horses in England, and for men in Scotland." A celebrated judge retorted, "But where will you find such horses, and such men."

BARLEY. The hardiest of all cereals. Many kinds, including beardless varieties. The beards of barley stick to clothing. The illustration selected is a specimen of "O.A.C. No. 21," the most widely grown barley in Canada. It is much used for malted liquors like beer. It is a six-rowed bearded barley. More than 95% of the barley grown in Ontario is of this variety.

BUCKWHEAT

BUCKWHEAT. Much used for griddle-cakes. Seed resembles beech-nuts in shape. A ripening field becomes dark brown, and gives out a strong and not unpleasant odor. Bees get abundant supplies of dark, strong-flavored honey. Buckwheat is planted later than other cereals, and ripens late.

FINDING CURIOSITIES

My friend and fellow-camper, Jerry Britton, of Montreal, can see resemblances to living things in stray "flotsam and jetsam." He is specially successful in concocting prehistoric creatures with the aid only of "the odd tack."

For light and air; sweet sense of sound and smell;
For ears to hear the heavenly harmonies;
For eyes to see the unseen in the seen;
For vision of The Worker in the work:
For hearts to apprehend Thee everywhere;
For that sweet impulse of the coming spring;
For ripening summer, and the harvesting;
For all the rich autumnal glories spread;
The flaming pageant of the ripening woods;
The fiery gorse, the heather-purpled hills;
The rustling leaves that fly before the wind,
And lie below the hedgerows whispering;
For meadows silver-white with hoary dew;
For sheer delight of tasting once again
That first crisp breath of winter in the air;
For all that makes for quiet in the world;
For all that lifts man from his common rut;
For every wide-flung window of the soul;
WE THANK THEE, LORD!

—*John Oxenham. "Bees in Amber."*

And Nature, the dear old nurse, took
The child upon her knee,
Saying: "Here is a story-book
Thy Father has written for thee.
Come, wander with me," she said,
"Into regions yet untrod:
And read what is still unread
In the manuscripts of God."
And he wandered away and away
With Nature, the dear old nurse,
Who sang to him night and day
The rhymes of the universe.
And whenever the way seemed long,
Or his heart began to fail,
She would sing a more marvellous song,
Or tell a more wonderful tale.

—*Longfellow, on the fiftieth birthday of the great naturalist Agassiz, 1857.*

PRESERVATION OF SPECIMENS

By Stuart L. Thompson

Specimens of grasses, sedges and rushes can hardly be collected and preserved as readily as other plants. As these plants dry there is a tendency for them to crumble and drop their seeds so that it is almost impossible to keep them pressed and on cards.

The most suitable method is to keep such specimens under glass. Lay your specimen, just as it is, upon a layer of pure white cotton batting which is backed by a piece of cardboard. Over the specimen lay a piece of glass. With passe partout binding the glass, cotton and card can be all firmly held together with your specimen showing clearly on the cotton through the glass. Here it will keep indefinitely and if not exposed to light will retain its fresh green color. The glass permits examination of the specimen at any time without handling. Any data required can be written on the card behind. The size of the whole is a matter of choice. Generally specimens require glass about 10 x 13 or 11 x 14 inches and can be readily packed away, done up in this way.

WHITE-HEATH ASTER. Michaelmas Daisy. *Aster Ericoides. Per.* Sept.-Nov. Dry fields and roadsides and margins lakes and rivers. Tiny flowers, white, with yellow discs and 15-25 rays. Cultivated for bees; one of the latest flowers to furnish nectar. Resembles *A. villosus,* but latter has hairy stems and leaves. White asters grow very abundantly, but there are more kinds of blue and purple asters. Has many common names—Farewell Summer, Frost-weed, etc. Very small, bract-like leaves. S. 263: M. 490.

LONG-FRUITED ANEMONE. Thimbleweed, gone to seed. *Anemone cylindrica*. *Per*. May-July. Rocky woods and dry barren lands. About two feet high, silky hairs. It is smaller than the Tall Anemone (*A. Virginiana*) which it resembles.

FALSE ASPHODEL. Tofieldia glutinosa. *Per*. June-July. Moist ground. Stems and leaf-stalks very sticky. White or greenish. S. 57.

UPLAND WHITE ASTER. Aster ptarmicoides. *Per*. Canada's earliest aster. Dry calcarious soil. About a foot high. Flat corymbs of flat heads. S. 264.

BURNET Sanguisorba canadensis. *Per*. July-Oct. Atlantic provinces. Bogs and and wet meadows. No petals. Name from Latin *sanguis*, blood, and *sorbere*, to absorb. Used in folk-medicine. Greenish-white. Three to six feet high. S. 133.

TALL FLAT-TOPPED WHITE ASTER. Aster umbellatus. Per. Aug.-Oct. Leafy. Smooth stem sometimes 6 feet high or more. Edge of woods and low ground. One half inch to one inch broad. Long, tapering leaves. S. 265: M. 496.

RABBIT-FOOT, STONE or PUSSY CLOVER. Trifolium arvense. Ann. Aug.-Sept. Old sand or gravelly fields. Sweet-scented. Heads very soft-silky and grayish, or gray-pink. Corolla green-white. Triple leaves, blunt tips. Plant less than a-foot high. S. 144; M. 210.

WHITE CAMPION. Evening Lychnis. *Lychnis alba*. *Bien*. July-Oct. Waste grounds and roadsides. White or pink, fragrant, opening in evening. Resembles Night-flowering Catchfly, No. 26 in "Some Familiar Wild Flowers." Mostly dioecious, that is, male and female flowers on different plants. The scientific name is from the Greek word for lamp. Fertilized by moths. S. 96: M. 120.

CANCER-ROOT. Naked Broom-rape. *Orobanche uniflora*. *Per*. May-June. Parasitic herb, destitute of green foliage. Damp woodlands. Draws sustenance from roots of beech tree. Purplish, or light violet; rarely cream white. Fragrant (slightly). Three to six inches high. S. 232: M. 425

DYER'S ROCKET. Mignonette. *Reseda alba*. Waste places. Greenish-white. Name from Latin *resedare*, to calm, referring to supposed sedative properties.

HORSERADISH. *Radicula Armoracia*. *Per*. June-Aug. Moist ground. Escape from cultivation. Large white roots with very strong peppery quality are used as a table relish. Root leaves very large. S. 117: M. 170.

ENCHANTER'S NIGHTSHADE. Circaea alpina. Per. July-Aug. Damp and shady woodlands. Fruit small and bur-like, club-shaped. Smooth, watery, translucent, ruddy stem. Though named "alpine" it is not restricted to high altitudes. The above photo was taken from a specimen found on a farm near Oakville, Ont. The great botanist Gerarde, in honor of whom the Gerardias are called, wrote (1633) of this flower with smooth feeble stems and heart-shaped leaves that the latter are "sharpe at the point like unto Spinage." S. 178: M. 300.

COMMON NIGHTSHADE. Solanum nigrum. Ann. July-Sept. Waste places, near dwellings. Berry black. It is much debated whether fruit and leaves are edible. Resembles perennial blue Bittersweet (*Solanum dulcamara*), No. 151 in "Some Familiar Wild Flowers." S. 221: M. 412.

WOOD NETTLE. Laportea canadensis. July-Sept. Rich woods. Leaves large, ovate, long leaf-stalks. Contact causes a sharp continuing stinging sensation. S. 82.

SEA MILKWORT. Glaux maritima. Per. June-July. Sea-shore. A fleshy herb. Flowers in the axils, almost without stalks. No corolla. No stems to leaves. Dull purple-white or pinkish. Glaux is from Greek word meaning sea-green. This is not one of the milkworts which have the name *Polygala* (Greek for "much milk"). Polygalas have no milky juice, but feeding on them was supposed to increase the flow of cattle's milk. S. 199: M. 348.

POISON IVY. Poison Oak. *Rhus toxicodendron.* May-June. Thickets, woodland borders. Flowers fragrant, greenish or yellowish white, in loose clusters in the axils of the leaves. Fruit, small, smooth, white, waxy or dun-colored, globular, clustered. (Fruit of Virginia Creeper is blackish). Leaves divided into three somewhat four-sided pointed leaflets, varying greatly in size and form. Usually a creeping vine, but occasionally (as in above illustration) becomes almost a shrub. Climbs by rootlets. Leaves sometimes notched irregularly, sometimes without indentations. Flowers are polygamous, that is, have staminate (male), pistillate (female) and perfect flowers on one plant. Virginia Creeper leaves are usually five-divided. Some people think Poison Ivy specially dangerous at night, or in early summer. Poison is in a powerful non-volatile oil contained in all parts of the plant. Be careful, therefore, not to crush it with exposed foot or hand. Many people are immune. Inflammation is succeeded by tiny blisters and burning sensation. The effects may recur in the next season without contact with the plant. Wash with strong hot soap suds. Rub solution of alcohol and sugar of lead (poisonous if taken internally). Extract of Witch-hazel relieves as also does juice of Jewel-Weed. Leaflets of Poison Ivy are smooth, not shiny, light green. Larger leaves are more likely to be notched or wavy. The milky juice stains fabrics indelibly. I shall be glad to have some scientist estimate the age of this remarkable growth of Poison Ivy. It is in the neighborhood of Hamilton, Ont. S. 162, 167: M. 252, 260.

SANDWORT. Arenaria laterifolia. Per. May-June. Gravelly shores and thickets. S. 97.

SUN SPURGE. Wartweed. *Euphorbia Helioscopia. Ann.* Along the Great Lakes. This specimen found in Nelson Township, County Halton, Ont. Thirty kinds of Spurge mentioned in Gray; twelve in Spotton. Milky acrid juice. Flowers greenish and tan. S. 160: M. 248.

LONG-LEAVED STITCHWOOD or STARWORT. Stellaria longifolia. June-July Grassy, wet places. Fruit pale straw-colored. Grass-like leaves. Five petals look like ten. A kind of Chickweed, but flowers are larger. S. 97: M. 124.

BASTARD TOADFLAX. Comandra umbellata. Per. May-June. Dry grounds and open woods. Roots form parasitic attachments to roots of trees and shrubs. No corolla. Fruit nut-like. Stem not over one foot high. Flower greenish-white. S. 83.

SILVERROD. White Goldenrod. *Solidago bicolor*. *Per*. Aug.-Oct. Dry ground. The only goldenrod that is not yellow. Rarely inland. From P.E.I. to Ga.; never west of Mich. Hairy gray stems 6 in. to 4 ft. high. Ray florets whitish or cream. Survives early cold. Flower clusters mignonettelike in appearance. More like a rod than any other goldenrod. Hairs on stem protect from heat. There is only one species of Goldenrod native to Great Britain. S. 258: M. 474.

SWEET CICELY. Osmorrhiza longistylis. Per. Osme, scent, *rhiza*, root. Earliest flowering of the white parsleys. Roots have pleasant flavor. Do not confound with Water Hemlock, which is poisonous and flowers later. Distinguish from Hairy Sweet Cicely. S. 187: M. 314.

CYPRESS SPURGE. Euphorbia Cyparissias. Per. June-Sept. Roadsides and waste places. From Europe, an escape from gardens. Greenish-white, stained with russet red. Milky juice poisonous in quantities. "The plants are noticeable from their manner of massing by the roadside, where they convey the impression of having walked out in a body from some neighbouring graveyard." (G. L. Walton). S. 160: M. 248.

TRILLIUM. Green and White. A freak, but not unusual. In great profusion near Norval, Ont. Trilliums (as name implies) have parts in threes—sepals, petals, styles, leaves, etc.

Zygadenus chloranthus. Per. A member of the Lily Family. No English name. Greenish-white. Bulbous base. Calcareous soil. Sepals marked with an inverted heart-shaped gland.

WHITE SNAKEROOT. Eupatorium urticaefolium. Per. July-Sept. Moist rich woods. Thistle family. Handsomer than Boneset, which it resembles. Ten to thirty tiny florets in a head. S. 255: M. 470.

TRILLIUM, FOUR-PETALED. Trillium grandiflorum. Per. A freak. In 1930 in Muskoka, Ont., I saw one with 15 petals.

GREAT ANGELICA. A. atropurpurea. Stem stout, dark purple, 4 to 6 ft. high. Strong scented. Marshes and low lands. S. 186.

SPRING CRESS. Cardamine bulbosa. April-May. Wet meadows and beside springs. The variety with magenta-purple flowers has a slightly woolly stem and blooms earlier. S. 118; M. 166.

IVA. Marsh Elder. *I. Zanthifolia.* This is a flower of the Prairie Provinces, but this specimen was found growing near Toronto. S. 256.

ORCHIS, GREEN ROUND-LEAVED. A closer view of No. 76 in "Some Familiar Wild Flowers." S. 65; M. 86.

WILD GARLIC. Allium canadense. Per. May-June. Along river banks. Flowers few and often none. Pale rose-color to white. Often bears a head of bulblets. Leaves, lance-oblong, 5-9 in. long, 1-2 in. wide, wither before flowers appear. Strong onion smell and taste. Closely resembles *Allium tricoccum* (Wild Leek). The picture of the root was taken with a very dark cardboard background to give the root a natural appearance. S. 59: M. 56.

BLAZING STAR. Button Snakeroot. *Liatris cylindracea. Per.* Late summer and autumn. Sandy fields and thickets. Rose-purple. The above is flower in seed. S. 254

HELLEBORINE. Serapias Helleborine or *Amesia latifolia*. *Per.* July-Aug. Alluvial soil, or underbrush about banks of wooded, sluggish streams. Green, suffused with madder purple. All flower lovers should have in their libraries "Our Wild Orchids," by Frank Morris and E. A. Eames (Charles Scribner's Sons, 1929), the best recent book on orchids. "Orchid seeds are as minute as fern spores, and may be carried miles by the wind." S. 67.

HEART-LEAVED ASTER. A. cordifolius. Per. Aug.-Oct. Woods and thickets. Very like *A. Lydleyanus.* Lilac or lighter. Leaves heart-shaped with stalks. "There are about 120 species of native asters (54 in N.E. part of Continent), of which all but a dozen have purple or blue ray-flowers. Great Britain has only one native wild aster." (Mrs. Starr Dana). S. 262: M. 488.

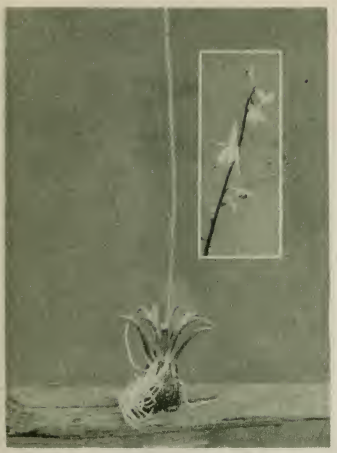
KNAPWEED. Spanish Buttons. *Centaurea nigra.* July-Sept. Fields and roadsides. Sister to *C. jacea.* See No. 162 in "Some Familiar Wild Flowers." Also called Star Thistle. Rose-purple. S. 251.

PEPPERMINT. Mentha piperita. Per. July-Aug. Along brooks and in wet places. Smooth; very pungent-tasted. Flowers odorous; stems, square. From Europe, an escape from gardens. Volatile oil obtained from distilling its leaves. Flavor for candies. In medicine used as stimulant, and to allay nausea. Commercially cultivated. Square stem often stained deep madder-purple. S. 216: M. 392.

SAVORY, CALAMINT. Satureia glabra or *Clinopodium glabrum.* Rocky banks, wet limestone rocks. Same family as Summer Savory. Purplish or whitish. Blooms all summer. S. 217.

CANADA THISTLE. Cirsium arvense. Per. July-Sept. Lilac to pale magenta. Fields and roadsides. Fragrant. A weed which in many municipalities must be cut down or owner of land fined. Rootstock must be eradicated and plants must not be allowed to go to seed. Notice how leaves are curled or ruffled. Stamens (male) are purple; pistils (female) are white. There are six common thistles: Common Bull T. (*lanceolatum*), Swamp T. (*muticum*), Large Pasture T. (*pumilum*), Tall Tl. (*altissimum*), Yellow T. (*horridulum*), on sea-shore, Sow T. (*Sonchus oleraceus*), yellow. The story is that it saved Scotland from the Danes, as a Danish soldier stepped on one, and cried out, thus saving the Scottish army from an ambush. Hence the Scottish emblem. S. 250: M. 522.

COMMON SPEEDWELL. Veronica officinalis. Per. June-Aug. Prostrate, hairy stem, erect at end. Dry hills and open woods. This is a closer view than No. 161 of "Some Familiar Wild Flowers." The Latin word "officinalis" indicates that the plant is used in medicine or in the arts. Leaves light green; flowers light lavender. There is a legend which tells how when Jesus was on the way to Calvary, a maiden handed Him her kerchief to wipe His face as He suffered from "the agony and bloody sweat." And thereupon His features were forever impressed on the linen cloth. *Vera iconica* is Latin for "true image." The maiden was canonized as St. Veronica and St. Peter's Rome claims to have the kerchief. S. 225: M. 424.



WATER LOBELIA. *Lobelia Dortmanna*. July-Aug. Grows in ponds and lakes. This specimen had a stem more than 2 ft. 6 in. long. Thick, small, short, hollow leaves in a rosette close to the sandy bottom. S. 242; M. 464.

GREAT LOBELIA. A closer view of No. 148 in "Some Familiar Wild Flowers." S. 242; M. 462.

WITCHES-BROOM. Also called Crow's-nest. A diseased condition of a tree or shrub due in some cases to parasitic fungi. The portion of the stems between leaves become shortened and there is an excessive multiplication of branches.

TAWNY HAWKWEED. *Hieracium aurantiacum*. July-Sept. This flower was photographed in Northern Ontario within 30 miles of a cemetery where a specimen imported from England was planted 30 years ago when the flower was unknown in that locality. It has since become a troublesome weed. M. 625.

ALSIKE CLOVER. Trifolium hybridum. Per. May-Oct. Meadows and waysides. *Trifolium* from two Latin words, meaning three leaves. Resembles White Clover, but flowers are rose-tinted, and stems erect. Extremely sweet-scented, and rich in honey. "As the florets open, they spread outward and downward; and as they fade, the dried light brown husks form a rusty collar round the stem, lending a ragged touch to the tidy, still blooming florets above them. This species is sometimes cultivated for fodder." (Stack) Also called Alsatian Clover. S. 145: M. 212.

AMERICAN SEA-ROCKET. Cakile edentula. Ann. July-Sept. Seaside and shores Great Lakes. S. 123.

MONKEY-FLOWER. Mimulus ringens. Per. June-Sept. In swamps and beside streams. Name alludes to grin that some people think they see on the corolla. Scientific name from Greek for buffoon. Purple, sometimes white. Square hollow stem. Method of fertilization is interesting. *Ringens* is Latin for "gaping." S. 227: M. 422.

LARGE CORAL ROOT. Corallorrhiza maculata. Per. July-Aug. Spruce woods. An orchid. Madder-purple or yellow. Ten to thirty flowers. Spur more prominent than *C. trifida.* ("Familiar Wild Flowers," 135). Slightly fragrant. White lip. Observe root. A parasite. Does not require leaves. Only leaf is a sheath near the base. S. 68: M. 70.

BEACH PEA. Lathyrus maritimus. Per. Early summer. Sand hills of the sea-shore, and on shores of Great Lakes. Purple. Trailing or climbing. Stout grooved stem. Six to ten flowers. S. 150: M. 224.

COMMON COMFREY. Symphytum officinale. Per. June-July. Moist places. Escaped from gardens. Scientific name is from a Greek word, meaning "to cause to grow together," and the word *officinale* indicates that the plant was used in medicine. Thickened bitterish mucilaginous roots. Pinkish or yellowish-white to bluish or roseate purple. S. 209.

PALE LAUREL. Kalmia polifolia. Per. May-June. Bogs. A pretty straggling shrub about a foot high, with only a few flowers. Pinkish-white, or lilac. Smaller than Sheep Laurel. Narrow evergreen leaves, edges rolled back, and white-green beneath. S. 194; M. 334.

PURPLE or SPIKED LOOSESTRIFE. Lythrum salicaria. Per. A beautiful magenta color. June-Aug. Wet places. Naturalized from Europe. Called Long Purples and Spiked Willow-herb in England. Easily cultivated. Read "Nature's Garden," p. 116, and learn about trimorphism. S. 177: M. 288.

"There is a willow grows aslant a brook,
That shows his hoar leaves in the glassy stream,
There with fantastic garlands did she come,
Of crow-flowers, nettles, daisies and *long purples*
That liberal shepherds give a grosser name,
But our cold maids do dead men's fingers call them."
Shakes. Hamlet.

HEMP NETTLE. *Galeopsis Tetrahit. Ann.* July-Sept. Waste places and gardens. Magenta purple. Greek name means "head of a weasel." Tiny flowers, white-hairy, flower-cup bristly. Stem square, very hairy. Mint family. As high as three feet. S. 219: M. 410.

FEVERWORT. Horse Gentian. *Triosteum aurantiacum*. *Per*. May-July. Sandy woodlands. Dist. from *T. perfoliatum*, Tinker's Weed, or Wild Coffee, by the flower being distinctly two-lipped. The word *Triosteum* refers to the three bony nutlets (abbr. of *Triosteospermum*). Flower purplish-red. Fruit bright orange-red. S. 238: M. 448.

LARGE BUR MARIGOLD. Brook Sunflower. *Bidens laevis. Ann.* Aug.-Oct. Swamps and wet places. 10-24 in. high. A bur with two to four prongs. The only handsome member of the family, next of kin to the Golden Coreopsis. *Bidens* (two teeth) refers to the seed burs. "The innocent passer by—man, woman or child, wooly sheep, cattle with switching tails, hairy dogs or foxes, indeed any creature within reach of the vicious grappling-hooks—must transport them on his clothing; for it is thus that these tramps have planned to get away from the parent plant in the hope of being picked off, and the seeds dropped in fresh colonizing ground; travelling in the disreputable company of their kinsmen the beggar ticks, and Spanish needles, the burdock burs, cleavers, agrimony and tick-trefoils." (Nature's Garden, p. 361). S. 270: M. 514.

COMMON BEGGAR TICKS. Stick-tight. *Bidens frondosa. Ann.* Late summer. Damp ground. Uninteresting weed, one to eight feet tall. Brownish-yellow. *Bidens* (two-toothed) refers to two downwardly barbed awns or prongs of seeds that make them stick, and secure a wide distribution of the seed. "They greet us at every turn, and force us into rural free delivery service." S. 270: M. 512.

SPINY-LEAVED SOW-THISTLE. Sonchus asper. Ann. May-Sept. Waste places, roadsides. Formerly milk-juiced leaves were used as pot-herb. Leaves quite decorative. Resembles Common Sow Thistle and the perennial Field Sow Thistle. Fluffy down. Grows as high as ten feet. S. 270: M. 534.

HORNED BLADDERWORT. Utricularia cornuta. Per. June-Aug. Peat bogs, and sandy shores. Yellow helmet-shaped flowers very fragrant. Flower has large lip and a spur. Leaves, root-like, have little bladders which float the plant at flowering time. One to three feet. S. 320.

SUNDROPS. Small Evening Primrose. *Oenothera pumila* or *Kneiffia perennis. Per.* May-July. Dry sunny fields and banks of rivers and lakes. Pale yellow flowers open in sunshine. Common Evening Primrose opens in evening. Resembles English primrose only in color. S. 180: M. 298.

A primrose by the river's brim
A yellow primrose was to him,
And it was nothing mor

—*Wordsworth*

HONEWORT. Cryptotaenia canadense. Per. June-Sept. Rich woods and thickets, A member of the Parsley Family. Scientific name refers to hidden oil-tubes. S. 187.

SEA-SIDE CROWFOOT. Ranunculus Cymbalaria. June-Aug. In alkaline soil. Leaves clustered at the root and on the joints of the long rooting runners. S. 106.

Belongs to one of the 14 genera of the Crowfoot Family. In the 7th genus (Buttercup). Spotton names eighteen. S. 102; M. 128.

EYEBRIGHT. Euphrasia officinalis. Ann. July-Aug. White or yellowish. Lower St. Lawrence and sea-coast. Very dwarf form (less than 2½ in.) of *E. americana.* S. 229; M. 432.

WORM-SEED MUSTARD. Erysimum cheiranthoides. Bien. July-Aug. Waste wet places. S. 120.

SILVERY or *HOARY CINQUE-FOIL. Potentilla argentea. Per.* June-Sept Dry soil. Beautiful foliage. Smooth and green above: silvery and hairy under side of leaves. Pale terra-cotta stem covered with white wool. Upper foliage decreases in size so that light may not be shut off. White hairs help to retain moisture, and to protect from excessive sunlight. S. 136: M. 198.

COMMON MUGWORT. Artemisia vulgaris. Per. June-July. Waste places and along streams. One to three feet high. Green-yellow or purplish. S. 252; M. 516.

YELLOW BEDSTRAW. Galium verum. Per. May-Sept. Dry fields. Stems smooth, erect. The legend is that one species of Bedstraw was found among the hay on which the Virgin Mary slept. Bruised plant sometimes used to color cheese. Used also to obtain yellow dye The roots dye red. S. 235: M. 442.

TUFTED LOOSESTRIFE. Lysimachia thrysiflora. Per. May-July. Cold swamps. See notes on Yellow Loosestrife. S. 198.

YELLOW LOOSESTRIFE. Lysimachia vulgaris. Per. July-Sept. Roadsides and thickets near towns. Plain yellow without dark markings. Resembles *L. terrestris,* which is yellow, dark-dotted or streaked. Speaking of the reputation given to this flower by the Roman naturalist, Pliny, Parkinson writes: "It is believed to take away strife, or debate between ye beasts, not only those that are yoked together, but even those that are wild also, by making them tame and quiet—if it be either put about their yokes or their necks, which, how true, I shall leave to them shall try and find it so." No relation of the splendid Purple Loosestrife.

LARGE-LEAVED GOLDENROD. Solidago macrophylla. Per. July-Sept. Damp rocky woods. S. 258: M. 476.

WILD FLOWER PRESERVATION

A Further Plea

MANY of the beautiful flowers in this volume would be more familiar were it not for the ruthlessness of thoughtless people. In "Some Familiar Wild Flowers" appear lists of flowers that should be spared, of those that should be picked sparingly, and of those that may be gathered freely. Join the Wild Flower Preservation Society, 3740 Oliver St., Washington, D.C. ($1.00), and help the movement, at the same time learning a great deal.

In a radio address delivered last spring some kind folk thought I put the matter forcibly. May I repeat?

"There is an old song "If the Waters Could Speak as They Flow." I have written some songs and hymns, and am tempted to try my hand at one more "If Wild Flowers Could Speak as They Grow." What strong language would be heard when a horde of wild city folk swoop down on them, and leave a wake of havoc! When we go to the country to see friends there, we do not take them by the scruff of the neck, throw them into the motor-car, and say: "Come home with me, and live, and die with me"—unless perhaps we want to marry the girl. And even then it is not necessary to take her mother and all her family with us. So when we visit the abode of the wild flowers we need not carry off more than the fairest sample for our collection, or herbarium, leaving the rest of the family to delight the next passer-by, and to propagate flowers for the next season. When we go to the playhouse of "God of the Open Air," it is not correct etiquette to destroy the beautiful carpet of bloom, or the draperies that grow or hang on the trees.

"Misuse may destroy our possessions. I have heard the saxophone played divinely, and I have heard it sound like the wail of a lost soul, or of a cacophonous cat on the back fence. Therefore whether we are blowing music or plucking flowers, let us remember the Sixth Commandment, 'Thou shalt do no murder'."

WHAT IS AN ORCHID?

The ordinary idea of an orchid is that it is a somewhat expensive and rare flower, mostly grown in hot-houses, and usually of some indefinable and peculiar shape. If the above question were answered fully in technical language, the result might only increase the mystification. To answer it shortly and simply may invite unfavorable criticism from learned persons. However, I shall make an attempt.

If the reader wishes delightful entertainment and edification in letterpress and illustration, he will secure a copy of "Our Wild Orchids" (Charles Scribner's Sons). If he comes from Ontario he will rejoice that the author, Mr. Frank Morris of Peterborough Collegiate Institute, is a Canadian who has recently achieved fame both in the world of letters and of science.

The orchids are by no means all tropical plants. They are found from the Equator to the far north and south. They do not grow in any particular habitat but are found in wet and in dry places. They are not necessarily of any special striking color, but range from greenish to madder-purple. In temperate zones they are found from May to October. They are all perennials, and have perfect flowers, that is, flowers with both stamens and pistils.

The distinguishing feature of an orchid is that it has three similar sepals which are the same color as the three petals. Two of the petals are alike, and are on the sides of the flower. The third is unique, is called the "lip," is conspicuously colored, and often spurred. The parts of the flower are so placed that only strong visitors like bumble-bees can get at the nectar, and in doing so their heads or long tongues come in contact with the pollen, and carry it to the sticky female portion of the next orchid visited, thus ensuring cross-fertilization. Indeed most orchids are incapable of self-fertilization.

I am indebted to Mr. Frank Morris for the following statement in fuller detail.
"The peculiarity of an orchid is that its stamens and pistil are all welded into a single fleshy pillar called the column. At the top of the column both the pollen bundles and the stigma or entrance to the ovary are situated. Surrounding the column is what we commonly call the flower, consisting as in the lilies of six parts, an outer ring or calyx of three sepals and an inner ring or corolla of three petals. Instead, however, of the three petals being alike, as is the case with the lilies, the middle petal is noticeably different from the other two. It is generally larger and brighter, and often curiously shaped, spurred, grooved, lobed, bearded or ridged. In the case of the Lady Slippers or Moccasin Flowers, the most widely known of our orchids, the lip is cup-shaped, and the two lower sepals are usually welded into a single large lobe, so that the floer appears to have but five parts instead of six."

NATURE GAMES

Campers may give zest to their hikes if they start competitions in naming flowers and other out-of-doors objects. Choose representatives from each tent or tribe, limit the number of the party to about fifteen, elect a judge and a secretary, give one mark for finding, and one mark for naming, and see who wins. I always take a supply of "Familiar Wild Flowers" so that each hiker may have a copy to help identification.

A "Nature Hunt Chase" has always been a success in the many camps in which I have introduced it. Numbered aluminum discs are placed beforehand on trees and other objects, envelopes hidden at intervals in crotches of trees, clefts of rock, etc., and in these envelopes are placed numbers for the team to extract to prove that they have found the envelope (which must be carefully replaced for the next seeker), the various teams start at intervals about a quarter of an hour apart so that they may not encounter one another, and the race is against time. In the last lap, or "spasm," is sometimes hidden a box of candy or other reward. The directions, carefully prepared beforehand, are handed to each leader, and are best if in verse. Here is some sample doggerel.

FIRST SPASM

1. This game, played by groups, is a race against time,
   The direction we put into "doggerel rhyme;"
   Fifteen minutes or more between starts let there be,
   So that one group mayn't follow and see
   The difficult turns, and the spots high and low,
   Over which we must scramble and search as we go.

2. With a compass in hand let the chief of each band
   Lead his group to the steps of the shop where is "tuck;"
   Thence north 60 paces—here's hoping for luck—
   Thence north-west by west some 57 paces
   The group to the foot of a large hemlock races.
   (On your way see a beech, the disc (1) out of your reach),
   Then further some 38 steps with your leader,
   You see by the path a graceful young cedar(2).

6. Your number extract, and with care you'll replace
   The Envelope ONE; then on with the race,
   Going 20 odd paces, a course to the west
   Some ten degrees south; go carefully lest
   You miss the next object, a lot boundary peg;
   Now sharp to the right you will turn a swift leg.
   At right angles go, till you come to a road,
   Some 25 paces—don't jump like a toad,
   But leap like an antelope to a sign in clear sight
   That tells you to douse any fires that you light.
   Here, pause for a signal, ere onward you roll;
   Each group must keep separate, right on to the goal.

On a well planned route, divided into three "spasms," the race may take from one to three hours, depending upon the intelligence of the groups. Various stunts may be included, such as crossing a stream, paddling a canoe with the hands, the canoe being hidden in bushes.

KNOWLEDGE TEST

Divide company into two sides. The side that gains most marks wins. The leader reads out the first description. Anyone who guesses right contributes 8 to his side and retires till the next round. No prompting or discussion allowed among players. Then leader reads second description. Successful guessers gain 7 each for their side, and so on till all eight descriptions are read. The guessers should hand their written guesses to the leader or whisper to him.

I AM A FERN

8. The Indians of Eastern U.S. used me in cases of difficult breathing.
7. I produce new fronds all summer long.
6. I live in moist shady spots in low woods.
5. My very young stems are covered with a bluish bloom, and my immature leaves are of a dull red color.
4. My stalk divides into two parts which curve away from each other.
3. My pinnules are peculiar, being one-sided, the mid-rib running along the lower margin
2. When I reach my full growth my stem is smooth, shiny and almost black.
1. Almost everyone recognizes me, and I suggest a beautiful girl's head.

I AM THE MAIDENHAIR FERN

I AM A FLOWER

8. I flourish in spring.
7. I grow in the woods, but when transplanted to gardens grow much taller.
6. My leaves are divided into three parts and my flower is covered over with a hood.
5. My flowers are many in number. My male and female flowers are on different plants.
4. My bright scarlet berries are good to eat when cooked.
3. I like to have my feet wet, but I carry an umbrella.
2. I grow from an acrid bulb which may be eaten when cooked.
1. I get my name from an old time pulpit with its hood.

I AM A JACK-IN-THE-PULPIT

There is no limit to the number of tests that may be drawn up for ferns, mushrooms, flowers birds, trees, vines, mammals, etc. Place the more obvious statements towards the ends of each test. The author has secured some 25 samples.

FOR MY YOUNGER READERS

TWO of my grandchildren toddling off to the woods with "Granddaddy's flower book" tucked under their arms suggested that I write a special bit for the little ones. They may find it interesting to locate the flowers indicated by italics. They are in this book or in "Some Familiar Wild Flowers."

A ROYAL FAIRY WEDDING

The *blue-bells* are ringing, the birds are all singing,
Prince's Pine and *Queen Marguerite* marry to-day;
The guests all come thronging, to best families belonging,
And *Lily-pad* Land is the goal of the fay.

The bride—all elates her; *Queen Anne's Lace* decorates her;
Silkweed and *Cottongrass* serve for her gown;
Foxgloves on her hands, a *Spring-beauty* she stands,
Lady's Slippers she wears; for bow, *Thistle-down*.

Shod with *Moccasin-flower, Marigold* for his dower,
His *Shepherd's Purse* laden, lo! there stands the Groom!
Dutchman's Breeches this lover adopts for leg-cover:
His resplendent *Turk's Cap* will banish all gloom.

Blue-Flag calls "Attention," so now we must mention
That Old *Jack-in-the-Pulpit* arrives on the scene,
His *Skull-cap* transcendent, with *Gold-thread* resplendent,
His *Solomon's Seal* and his *Mitre-wort* clean.

Phlox of guests are invited, just three of them slighted,
Skunk Cabbage, Wake Robin, and rank *Camomile;*
All three stand to leeward, their scent wafted seaward;
Though *Sea Lavender* drenched they fail in their style.

The service completed, on *Royal Ferns* seated,
The fairies all feast on good things that are there;
Ram's Head and *Sheep Berry, Wild Ginger, Choke-Cherry, Honeysuckle, May Apple*—such excellent fare.

To drink healths there was ample—take *Elder* for sample,
Oswego and *Labrador, Camomile* Tea;
Painted Cups, Pitcher Plants, the Banquet enhance—
A wonderful wedding the fairies agree.

Cherry trees are so pretty, their flowers rain confetti,
The fairies depart on the *Wind Flower* blown;
The bride and the groom, pledged to love *Everlasting,*
To their home in the woodland have happily flown.

J.E.J.

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I find earth not gray, but rosy,
Heaven not grim, but fair of hue.
Do I stoop? I pluck a posy.
Do I stand and stare? All's blue.

—*Robert Browning.*

Flowers rejoice when night is done,
Lift their heads to greet the sun;
Sweetest looks and odors raise
In a silent hymn of praise.

So my heart would turn away
From the darkness to the day;
Lying open in God's sight
As a flower adores the light.

—*Henry van Dyke.*

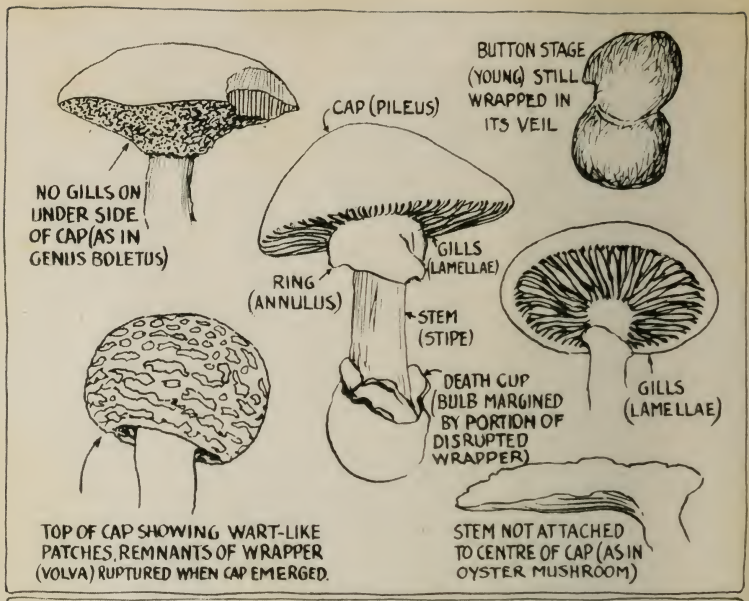
If I could put my woods in song
And tell what's there enjoyed,
All men would to my garden throng,
And leave the cities void.

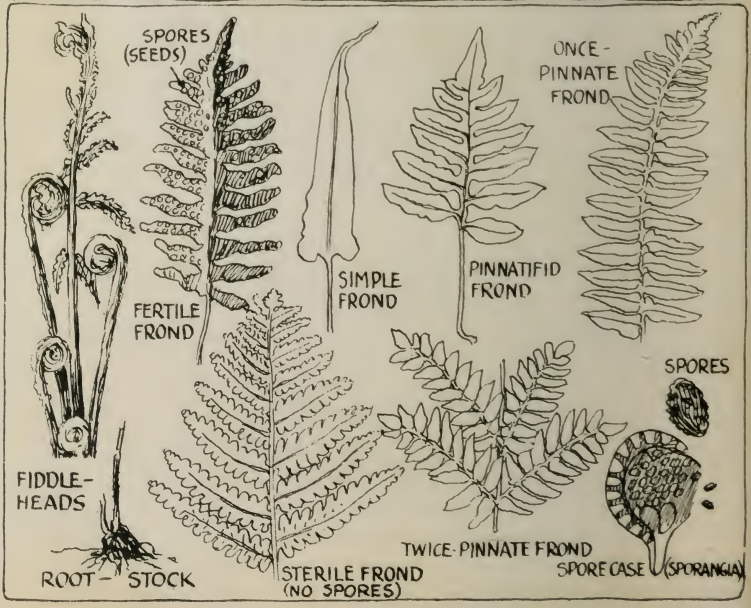
—*Whittier. "May Day."*

Come forth into the light of things;
Let Nature be your teacher.

One impulse from a vernal wood
May teach you more of man,
Of moral evil and of good
Than all the sages can.

—*Wordsworth. "The Tables Turned."*


BUTTON STAGE (YOUNG) STILL WRAPPED IN ITS VEIL
CAP (PILEUS)
NO GILLS ON UNDER SIDE OF CAP (AS IN GENIUS BOLETUS)
GILLS (LAMELLAE)
RING (ANNULUS)
STEM (STIPE)
DEATH CUP (BULB MARGINED BY PORTION OF DISRUPTED WRAPPER)
GILLS (LAMELLAE)
TOP OF CAP SHOWING WART-LIKE PATCHES, REMNANTS OF WRAPPER (VOLVA) RUPTURED WHEN CAP EMERGED.
STEM NOT ATTACHED TO CENTRE OF CAP (AS IN OYSTER MUSHROOM)


SPORES (SEEDS)
ONCE-PINNATE FROND
SIMPLE FROND
PINNATIFID FROND
FERTILE FROND
SPORES
FIDDLE-HEADS
TWICE-PINNATE FROND
ROOT-STOCK
STERILE FROND (NO SPORES)
SPORE CASE (SPORANGIA)

PURPLE LOOSESTRIFE

SERGES, GRASSES AND RUSHES

by the River Margin

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